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Patent / Docket No. 24061.37 (TSMC2002-1305)  
Customer No. 42717

*1fw*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Chung Long Chang, et al.	§	Docket No.:	24061.37
		§		(TSMC2002-1305)
Serial No.:	10/686,866	§		
		§	Examiner:	To Be Determined
Filed:	October 16, 2003	§		
		§	Art Unit:	2831
For:	Compact Capacitor Structure	§		
	Having High Unit Capacitance	§		

**PETITION AND RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS  
FILING DATE GRANTED**

Mail Stop Missing Parts  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Notice to File Corrected Application Papers (Filing Date Granted) mailed on April 29, 2004 requiring submission of omitted items, which includes the abstract and page 14, for the above-referenced application, Applicants hereby petition that the omitted items were in fact deposited in the U.S. Patent and Trademark Office with the nonprovisional application papers at the time of filing.

Applicants enclose herewith a copy of the abstract and page 14 of the specification (description and claims). Also, Applicants enclose a copy of the Express Mail Certificate, Utility Patent Application Transmittal and return receipt postcard indicating that the U.S. Patent and Trademark Office received 18 pages of the specification, which included page 14 and the abstract.

Enclosed is the petition fee of \$130.00 as set forth under 37 CFR 1.17(h). However, Applicants submit that the enclosures provide sufficient evidence that the above items were not, in fact, omitted and therefore, Applicant respectfully requests refund of the petition fee of \$130.00.

The Commissioner is hereby authorized to charge any deficiency fees or credit refunds or any overpayments associated with this communication to Deposit Account No. 08-1394.

Respectfully submitted,

David M. O'Dell  
Reg. No. 42,044

Date: 6-1-04

HAYNES AND BOONE, LLP  
901 Main Street, Suite 3100  
Dallas, Texas 75202-3789  
Telephone: 972-739-8635  
Facsimile: 214-200-0853

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Mail Stop: Missing Parts, Commissioner for Patents P.O. Box 1450; Alexandria, VA 22313-1450 on the date indicated below.	
Name	<u>Karen L. Underwood</u>
Date	<u>June 1, 2004</u>

06/04/2004 SSESHE1 00000078 10686866 130.00 DP  
01 FC:1460



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
10/686,866	10/16/2003	Chung Long Chang	24061. / TSMC2002-1305

27683  
HAYNES AND BOONE, LLP  
901 MAIN STREET, SUITE 3100  
DALLAS, TX 75202



CONFIRMATION NO. 7401

FORMALITIES LETTER



\*OC000000012479913\*

Date Mailed: 04/29/2004

NOTICE TO FILE CORRECTED APPLICATION PAPERS

*Filing Date Granted*

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given **TWO MONTHS** from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- An abstract of the technical disclosure not exceeding 150 words in length and commencing on a separate sheet in compliance with 37 CFR 1.72(b) is required. An abstract was not provided for this application.

The following item(s) appear to have been **omitted** from the application:

- Page(s) **14** of the specification (description and claims).

I. Should applicant contend that the above-noted omitted item(s) was in fact deposited in the U.S. Patent and Trademark Office (USPTO) with the nonprovisional application papers, a copy of this Notice and a petition (and \$130.00 petition fee (37 CFR 1.17(h))) with evidence of such deposit **must** be filed within **TWO MONTHS** of the date of this Notice. The petition fee will be refunded if it is determined that the item(s) was received by the USPTO.

II. Should applicant desire to supply the omitted item(s) and accept the date that such omitted item(s) was filed in the USPTO as the filing date of the above-identified application, a copy of this Notice, the omitted item(s) (with a supplemental oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to such items), and a petition under 37 CFR 1.182 (with the \$130.00 petition fee (37 CFR 1.17(h))) requesting the later filing date **must** be filed within **TWO MONTHS** of the date of this Notice.

Applicant is advised that generally the filing fee required for an application is the filing fee in effect on the filing date accorded the application and that payment of the requisite basic filing fee on a date later than the filing date of the application requires payment of a surcharge (37 CFR 1.16(e)). To avoid processing delays and payment of a surcharge, applicant should submit any balance due for the requisite filing fee based on the later filing date being requested when submitting the omitted item(s) and the petition (and petition fee) requesting the later filing date.

III. The failure to file a petition (and petition fee) under the above options (I) or (II) within **TWO MONTHS** of the date of this Notice (37 CFR 1.181(f)) will be treated as a constructive acceptance by the applicant of the

application as deposited in the USPTO. **THIS TWO MONTH PERIOD IS NOT EXTENDABLE UNDER 37 CFR 1.136(a) or (b).** In the absence of a timely filed petition in reply to this Notice, the application will maintain a filing date as of the date of deposit of the application papers in the USPTO, and original application papers (*i.e.*, the original disclosure of the invention) will include only those application papers present in the USPTO on the date of deposit.

In the event that applicant elects not to take action pursuant to options (I) or (II) above (thereby constructively electing option (III)), amendment of the specification to renumber the pages consecutively and cancel incomplete sentences caused by any omitted page(s), and/or amendment of the specification to cancel all references to any omitted drawing(s), relabel the drawing figures to be numbered consecutively (if necessary), and correct the references in the specification to the drawing figures to correspond with any relabeled drawing figures, is required. A copy of the drawing figures showing the proposed changes in red ink should accompany with any drawing changes. Such amendment and/or correction to the drawing figures, if necessary, should be by way of preliminary amendment submitted prior to the first Office action to avoid delays in the prosecution of the application.

Replies should be mailed to: Mail Stop Missing Parts  
Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

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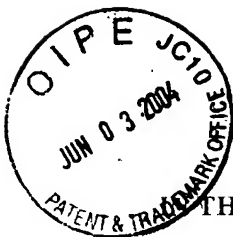
*A copy of this notice **MUST** be returned with the reply.*



Customer Service Center

Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE



PATENT / DOCKET NO. 24061.37 / TSMC2002.1305  
Customer No. 27683

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:  
Chang et al.

Serial No. Unknown

Filed: Herewith

For: Compact Capacitor Structure Having High  
Unit Capacitance

§  
§  
§  
§  
§  
§  
§  
§

Group Art Unit: Unknown

Examiner: Unknown

EXPRESS MAIL CERTIFICATE

Mail Stop Patent Application  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Express Mail Number: EV 333435900 US

Date of Deposit: October 16, 2003

I hereby certify that the following attached papers and fee:

1. Utility Patent Application Transmittal;
2. Fee Transmittal (in duplicate);
3. Application Data Sheet;
4. Patent Application consisting of 18 pages of specification, 25 claims and 1 page Abstract of Disclosure;
5. Four (4) drawing sheets;
6. Executed Declaration;
7. Assignment and Recordation Cover Sheet;
8. Check in the amount of \$900.00 (\$860.00 for filing fee and \$40.00 for recordation of Assignment);  
and
9. Return Postcard

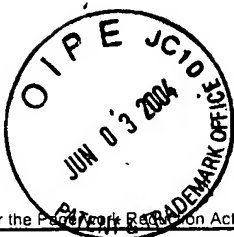
are being deposited with United States Postal Service "Express Mail Post Office to Addressee" to the Mail  
Stop Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Bonnie Boyle

Typed or Printed Name

Bonnie Boyle

Signature



PTO/SB/05 (08-03)

Approved for use through 07/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE

Under the Patent and Trademark Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UTILITY  
PATENT APPLICATION  
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	24061.37 / TSMC2002-1305
First Inventor	Chung Long Chang
Title	Compact Capacitor Structure Having High Unit Capacitance
Express Mail Label No.	EV 333435900 US

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

## ADDRESS TO:

Mail Stop Patent Application  
Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
2. ☐ Applicant claims small entity status.  
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 18]  
(preferred arrangement set forth below)
  - Descriptive title of the invention
  - Cross Reference to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113). [Total Sheets 4]
5. Oath or Declaration [Total Sheets 2]
  - a. ☒ Newly executed (original or copy)
  - b. ☐ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 18 completed)
    - i. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s)  
name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☒ Application Data Sheet. See 37 CFR 1.76

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
  - a. ☐ Computer Readable Form (CRF)
  - b. Specification Sequence Listing on:
    - i. ☐ CD-ROM or CD-R (2 copies); or
    - ii. ☐ Paper
  - c. ☐ Statements verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

9. ☒ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney  
(when there is an assignee)
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure ☐ Copies of IDS Citations  
Statement (IDS)/PTO-1449
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)
16. ☐ Nonpublication Request under 35 U.S.C. 122  
(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☒ Other: Express Mail Certificate: Check .....

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: .....

Prior application information:

Examiner

Art Unit:

For CONTINUATION OF DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

## 19. CORRESPONDENCE ADDRESS

☒ Customer Number: 27683 OR ☒ Correspondence address below

Name	David M. O'Dell		
Address	Haynes and Boone, LLP		
	901 Main Street, Suite 3100		
City	Dallas	State	TX
Country	USA	Telephone	9720739-8635
		Fax	972-692-9118

Name (Print/Type)	David M. O'Dell	Registration No. (Attorney/Agent)	42,044
Signature		Date	10-16-03

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

<b>DESCRIPTION OF PAPER</b>	Utility Patent Application Transmittal; Fee Transmittal (in duplicate); Application Data Sheet; Utility Patent Application consisting of 18 pages of specification, 25 claims and 1 page Abstract of Disclosure; Four (4) drawing sheets; Executed Declaration; Assignment and Recordation Cover Sheet; Check in the amount of \$900.00 (\$860.00 for filing fee and \$40.00 for recordation of Assignment); Express Mail Certificate and Return Postcard were received in the U.S. Patent Office on the date stamped hereon.		
<b>APPLICANT</b>	Chang et al.		
<b>SERIAL NO.</b>	Unknown	<b>DATE FILED</b>	Herewith
<b>ATTORNEY DOCKET NO.</b>	24061.37		
<b>TITLE</b>	Compact Capacitor Structure Having High Unit Capacitance		
<b>SENDER'S INITIALS</b>	DMO/bb	<b>DATE MAILED</b>	10-16-03

22581 U.S. PTO  
10/686866



RECEIVED

WATSON & MOONE LLP



11. The capacitor device recited in Claim 1 wherein the second and third electrodes each include a plurality of conductive layers.

12. The capacitor device recited in Claim 1 wherein a total unit capacitance of the capacitor device ranges between about  $1.3 \text{ fF}/\mu\text{m}^2$  and about  $2.0 \text{ fF}/\mu\text{m}^2$ .

13. The capacitor device recited in Claim 1 wherein a total unit capacitance of the capacitor device is about  $1.5 \text{ fF}/\mu\text{m}^2$ .

14. A method of manufacturing a capacitor device, comprising:  
forming a first interconnect over and coupled to a first electrode;  
coupling the first interconnect to a second electrode formed over the first electrode; and  
forming a second interconnect over and coupled to a third electrode, the third electrode interposing the first and second electrodes.

15. The method recited in Claim 14 further comprising:  
forming a first insulating layer interposing the first and third electrodes;  
forming a second insulating layer interposing the second and third electrodes; and  
forming a third insulating layer interposing the second electrode and the first and second interconnects.

## COMPACT CAPACITOR STRUCTURE HAVING HIGH UNIT CAPACITANCE

### ABSTRACT

[0031] The present disclosure provides a capacitor device including a first electrode formed over a substrate and a first insulating layer formed over the first electrode. A second electrode is formed over the first insulating layer and a second insulating layer is formed over the second electrode. A third electrode is formed over the second insulating layer and a third insulating layer is formed over the third electrode. First, second and third vias are then formed. The first via couples the first electrode and a first interconnect, the second via couples the second electrode and a second interconnect and the third via couples the third electrode and the first interconnect.